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November 20, 2000

Attorney Docket: 36956-162823

Assistant Commissioner for Patents
Washington, D.C. 20231
Attention: Box PATENT APPLICATION

Sir:

Submitted herewith is a patent application under 37 C.F.R. § 1.53(b) for:

Inventor: Robert C. Ross

Title: **SYSTEM, METHOD, AND COMPUTER PROGRAM
PRODUCT FOR PROVIDING A MULTI-USER E-MAIL
SYSTEM**

This is not a Provisional Application. This application claims priority of provisional application no. 60/166,409, filed November 19, 1999.

The application includes:

X Specification (30 pages), claims (18), and an abstract (1 page),
all in the English language.

X Formal drawings (9 sheets, Figures 1A-8C)

Fee (see formula below) :

Basic Filing Fee (large entity = \$710/small entity = \$355) \$355.00

Total number of claims in excess of 20 (0 x \$18) \$.00

Number of independent claims in excess of 3 (1 x \$40) \$ 40.00

Multiple Dependent Claim (\$270/135) \$.00

Assignment Recordation Fee (\$40) \$.00

TOTAL FEES \$395.00

Please charge the filing fee of \$395.00 to Deposit Account No. 22-0261. The Commissioner is authorized to charge any insufficient fee or any overpayment to Deposit Account No. 22-0261.

jc912 U.S. PTO
09/714997
11/20/00

In view of the above, it is requested that this application be accorded a filing date.

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Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Ralph P. Albrecht", written over a horizontal line.

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System, Method, and Computer Program Product for Providing a Multi-User E-Mail System

Inventor:

Robert Ross

Cross-Reference to Related Application

The present application claims priority to U.S. Provisional Patent Application No. 60/166,409, filed November 19, 1999 of common title, inventor, and assignee to the present invention, the contents of which are incorporated herein by reference in their entirety.

Background of the Invention

Field of the Invention

The present invention relates to electronic mail (e-mail) systems and more particularly, to multiple user e-mail systems.

Related Art

Electronic mail, also known as e-mail, is a widely used means of communicating between communication devices such as computers. A conventional e-mail system enables sending e-mail notes or e-mail messages much like a conventional postal letter from a source to a destination. For example, a sender could send an e-mail message including a return e-mail address to a receiver at the receiver's e-mail address on another computer through a network connecting the computers. E-

mail messages provide several advantages over conventional postal mail, such as, for example, faster preparation time, faster delivery time, a simpler addressing scheme than using name, street address or post office box, city, state and zip code, and lower cost. E-mail systems can provide an efficient means of distributing information internal to and external from an enterprise or business. However, conventional e-mail systems have limitations when used in, e.g., a manufacturing plant or production environment such as, e.g., a hospital, or retail business. For example, conventional e-mail systems require that each user have a computer with which to access the e-mail system. In a production or manufacturing environment, a machine operator often will not have access to a computer. Also, it may be unsafe in certain environments to permit a worker to be distracted by e-mail while performing tasks such as, e.g., monitoring a mission critical operation, such as where a worker is operating heavy machinery or a nurse in a hospital. Limitations of conventional e-mail systems can prevent many users within organizations from, e.g., accessing important corporate information that is most efficiently distributed over e-mail.

Historically, e-mail messages have included primarily text. Eventually, users were able to attach files for delivery along with an e-mail textual message. Such attached files are often called "attachments." Many e-mail systems support attaching multiple documents to an e-mail message. Unfortunately, when an e-mail user desires to forward an attachment, the attachment is conventionally forwarded along with the message containing it causing the forwarded e-mail with attachment to be encapsulated within the new e-mail.

One type of e-mail system is a client/server e-mail system. The e-mail system can use a centralized post office box that resides on a server somewhere on the network to which client e-mail

Early e-mail systems sent messages to users within an organization known as an intranet system, with little consideration taken to interacting with other e-mail systems or networks. An intranet is a term often used to describe a stand alone network or group of networks which includes a related group of senders and receivers, such as, for example, the employees of a commercial company.

Some intranet e-mail systems are equipped to inter-operate with other e-mail systems. Computers coupled by a network communicate by using communication software programs which in turn use a communication language or "protocol." Some e-mail systems are implemented using a so-called "open systems" communications method such as the transmission control protocol/ internet protocol (TCP/IP) suite of protocols. The TCP/IP protocol suite includes the SMTP e-mail functionality already mentioned.

An internet (i.e. with a lower case "i") is a network which couples two separate networks to one another. The global Internet (i.e. with a capitalized "I") is an internet that grew out of a U.S. Defense Advanced Research Projects Agency (DARPA) project. The Internet originally served a largely technical audience composed of the military, government agencies, and academic researchers and scientists. The original goals of the project were to allow researchers to share computing resources and to exchange information, regardless of their locations, and to create a resilient, fault-tolerant wide area network (WAN) for military communications. The global Internet implements communication using the TCP/IP communications protocols.

On-line service providers originally provided e-mail system access to individuals via modem connections. On-line service providers include, for example, American On Line (AOL),

CompuServe, and Prodigy. Online services traditionally created offerings targeted toward home computer users. These providers often provided proprietary e-mail systems to connect their users to one another. In time, users on proprietary on-line services, were able to send messages to users on other e-mail services via the Internet.

During the mid-1990's, commercial enterprises and individuals increasingly discovered the benefits of being connected to the Internet, eventually creating a mass-market phenomenon. Today, although access is limited in some areas, most countries have ties to the Internet. Thus, the Internet has enabled widespread, standardized intercommunication between users of disparate e-mail systems.

Small and medium sized businesses have many users which do not have access to a computer with which to send and receive e-mail. Workers in various professions including, e.g., healthcare workers in a hospital and retail, because of their jobs, may not have access to conventional email. It is desirable that all employees of a business have access to e-mail resources for such purposes as, e.g., for efficient distribution of information to employees from an employer. In many cases, it can be desirable that the employer not be required to purchase a computer for use by each of the employees. It is also desirable that the employer be able to filter out any junk e-mail, commonly known as "spam," being sent to the employees. It is also desirable that employees such as, e.g., in a retail business, production, or operations such as a hospital, not be permitted to access their e-mail at all times in order to maintain high worker productivity.

Thus, what is needed in an improved e-mail system which can provide access to various users in a production, or operational environment such as, e.g., healthcare, retail or other

professionals in an environment without individual access to a personal computer, who presently are unable to access e-mail and other useful functions.

Summary of the Invention

A method, system, and computer program product are provided that enable multiple users to access e-mail through a single shared computer including password authentication, secure definable file folder storage and a user access priority indicator. In one embodiment of the invention, the e-mail can include various new and useful features, such as, e.g., human resource communication and statistics tools, timeclock in/out, incoming mail filters, delayed receipt of e-mail, delayed message sending, auto-reply, auto-forwarding, encryption, automatic passing of a public key, advertising banners, embedded voicemail and video attachments, removal of embedded characters, direct attachment viewing, direct sending of attachments, spell-check, thesaurus, text view formatting (HTML or standard text), personal memo creation, address book, smartnames callup of addressee by typing letters of the name, user-selectable hotkey functions, remote logon to file folder from web interface, and an administration system for setup of passwords, secure folders, and filtering.

Further features and advantages of the invention, as well as the structure and operation of various embodiments of the invention, are described in detail below with reference to the accompanying drawings. In the drawings, like reference numbers generally indicate identical, functionally similar, and/or structurally similar elements. The drawing in which an element first appears is indicated by the leftmost digits in the corresponding reference number.

Brief Description of the Drawings

The foregoing and other features and advantages of the invention will be apparent from the following, more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings.

FIG. 1A is a block diagram of a distributed client/server e-mail system;

FIG. 1B is a block diagram of an exemplary system depicting an e-mail application program running on a computer hardware and operating system platform;

FIG. 2 depicts a conventional e-mail;

FIG. 3 is an example embodiment of a multi-user shared e-mail system according to the present invention; and

FIG. 4 depicts an exemplary computer system of the present invention.

FIG. 5 depicts an exemplary embodiment of a user interface of the multi-user e-mail system of the present invention.

FIG. 6 depicts an exemplary embodiment of a personal file folder system of the present invention.

FIG. 7 depicts an exemplary embodiment of a read receipt report according to the present invention.

FIG. 8A depicts an exemplary setup process of a public key infrastructure (PKI) using a public and a private key.

FIG. 8B depicts a exemplary embodiment of an improved setup process for configuring public and private keys according to the present invention.

FIG. 8C depicts an exemplary embodiment of a source code view of an email including an automatic embedded public key according to the present invention.

Detailed Description of the Invention

The preferred embodiment of the invention is discussed in detail below. While specific implementations are discussed, it should be understood that this is done for illustration purposes only. A person skilled in the relevant art will recognize that other components and configurations may be used without parting from the spirit and scope of the invention.

Overview of the Invention

In many production, retail, healthcare, hospital, manufacturing or other environments, workers do not have access to a computer and e-mail, and at scheduled times go to a break room for a break. The present invention is directed to a system, method and computer program product that enables multiple users to access a single shared computer to send, receive and store e-mail messages.

The system can be used continually in real-time working environment.

In one embodiment of the invention, the multiple user, shared single computer e-mail system permits these multiple users to view the computer and through a user interface identify whether new e-mail has arrived for any of the users.

In one embodiment, the users can use a touchscreen to identify themselves to the system and the system can then require entry of a password to authenticate the user. Alternatively, a conventional display monitor can be used for output of status information and a mouse or other pointing device or keyboard or other device can be used for input.

In another embodiment, the system can through its user interface identify a priority level of newly received e-mail, to prioritize which of the multiple users should gain access to the shared computer first. In one embodiment, the priority level can be identified by, e.g., providing a colored representation as to the urgency of the e-mail, such as, e.g., a colored or blinking name or button, or alphanumeric or other indication of priority such as, e.g., a ranked list.

In an embodiment of the invention, the user with the highest priority could then access the shared e-mail system first. The user with the highest priority e-mail message can then select to open his or her e-mail.

In one embodiment of the invention, a user can select to open the user's name by, e.g., using a mouse, key or highlighting a name or button with a cursor. In an embodiment, the user can then be prompted to provide authentication information such as, e.g., a password and/or company badge, to gain access to that user's personal e-mail environment.

In one embodiment of the invention, a user's personal e-mail environment can include, e.g., an inbox, an outbox, and at least one user definable file folder into which received messages can be stored. In an embodiment of the invention, the system can store messages in file folders named by sender of the message or can permit the user to provide another name for the folder such as

In another embodiment of the invention, a feature can be provided to store e-mail in a folder which can default to be titled by the sender's e-mail userid (i.e., also commonly referred to as username, screenname, or e-mail address). The user can be permitted to modify the folder name such as, e.g., to replace it with the sender's company name, or department name, or other designation for the folder such as, e.g., "personal," or "confidential."

In another embodiment of the invention, the system can automatically timeout and close a user's e-mail if no action has been made for a selectable period of time, to prevent unauthorized access to the user's e-mail environment.

An Exemplary Embodiment of the Invention

FIG. 1A illustrates a block diagram of e-mail system environment 100. Email system environment 100 can include an exemplary distributed client/server computer e-mail system. E-mail system environment 100 can include a sending user 102 which sends an e-mail message to a receiving user 104. Sending user 102 creates the e-mail on a client computer 106. Client computer 106 transmits the e-mail from sending user 102 to receiving user 104 on a client computer 110. An e-mail message may be created via mail client 116 of client computer 106 and may be sent via interaction with a mail server 118 on a server 112 over a communications network 114. An e-mail 200, described further below with reference to FIG. 2, in being sent from its source, i.e., sending user

can provide user 102 access via a storage module 138 to the mailbox of user 102 of e-mail storage 140.

FIG. 2 illustrates an example of a conventional e-mail 200. E-mail 200 includes various data components. Example data components included in e-mail 200, are creation information 202, a body 204, address information 206, and a subject 208.

In an example embodiment, creation information 202 can include, e.g., the date and time e-mail 200 was sent from sending user 102 to receiving user 104. The body 204 of e-mail 200 can include, e.g., a text portion 210 and embedded objects 212. Embedded objects 212 can include, e.g., attachments 214. Other embedded objects 216 can include, e.g., bit map images, graphics objects, executable programs, compressed text and applets. Embedded objects 216 can also include a forwarded e-mail 200. Address information 206 can include the e-mail address of sending user 102 and receiving user 104 of e-mail 200. Attachments 214 can also include other embedded objects 212. Subject 208 can include a brief description of the contents of e-mail 200. It would be apparent to persons skilled in the art that e-mail 200 can include a subset of the listed components.

FIG. 3 illustrates an example embodiment of an implementation of the present invention, including e-mail system 300. E-mail system 300 can include a computer 302 in communication with users 304, 306 and 308. Computer 302 includes a multi-user mail system 310. In a preferred embodiment, multi-user mail system 310 is a Point Clear e-mail system available from Point Clear.net, Inc. a wholly owned subsidiary of XANTE Corporation of Mobile, Alabama, USA. E-mail system 310 can include, in one embodiment, a prioritization module 312, an authentication

module 314, a storage module 316, an e-mail storage module 318, an in queue 326 and an out queue 328.

Since multi-user mail system 310 runs on a single computer 302, only one of users 304, 306 and 308 can access computer 302 at one time. Access to computer 302 can be prioritized using prioritization module 312. Prioritization module 312 can indicate which of users 304, 306 and 308 should have priority to access computer 302 and multi-user mail system 310. In one embodiment, the urgency of e-mail messages can be indicated as a form of priority. For example, e-mails from a particular e-mail address could trigger a higher priority, such as, e.g., an e-mail from the CEO of a company. Other indications of priority could include, receipt of an e-mail message, versus having no new messages. Informally, a supervisor could have a higher priority than a line worker who, in turn, could have higher priority than a part-time worker.

If the highest priority user is user 304 then user 304 can proceed to authenticate using authentication module 314 by, e.g., entering a password, to access a storage environment 320.

Assuming the proper authentication information is provided, then storage module 316 can provide user 304 access to storage environment 320 of e-mail storage 318 via storage module 316.

When user 304 sends an e-mail to another user, the e-mail can be routed via an out queue 328 to its final destination.

When user 304 receives an e-mail message from another user, the e-mail can be queued at in queue 326.

In one embodiment, in queue 326 and out queue 324 can be used to delay sending or receipt and for filtering operations.

In another embodiment, if an e-mail environment window is left open and is idle for a specified time then the individual's e-mail window logs out of the system. Log out can be based on, e.g., passage of a time duration or other criteria. This feature prevents unauthorized access to an account by public viewing after a user leaves the system computer without logging out.

In one embodiment, the system of the present invention can be provided for a discount such as, e.g., free, if users are willing to watch advertising. Free evaluation use could also be provided. With a free evaluation use, a date is identified after which use is disabled. After completion of particular criteria, access can be re-enabled preserving all file folders. In one embodiment, an advertising banner can be included and can be placed in a fixed location. Advertising, in one embodiment, can be provided from

In another embodiment, an address book importer can be provided to import address listings from other application programs.

In one embodiment of the invention, attachments of all types can be accessible for adding to an e-mail, saving from an e-mail, deleting from an e-mail, executing from the e-mail, and forwarding as an e-mail. An e-mail can also be forwarded as an attachment. Where an e-mail has several attachments, a user can select from multiple attachments by highlighting selected attachments for forwarding and the selected attachments only can be forwarded, in one embodiment.

In one embodiment, a spam eliminator can maintain a dynamic list of e-mail addresses that can be identified as sources from which e-mail is not accepted. The spam eliminator is a filter that can be based on e-mail address, domain name, or other identifier.

In one embodiment, online help can be provided.

In another embodiment, the address book can include groups of e-mail users.

In another embodiment, e-mail folder security can be provided restricting access to stored folders to only users entering authentication criteria such as, e.g., a password associated with that folder.

In another embodiment a spell checking feature can be provided.

In another embodiment, messages can be marked as urgent, (also referred to as hot, or hot mail), or can be identified as a priority level by inclusion in their body or otherwise of identifying priority information. In one embodiment, receipt of an urgent e-mail can initiate an urgency signal such as, e.g., a visual, graphical, or audio indication. Diagram 500 of FIG. 5, for example, depicts new mail via an envelope icon 512, 508. Urgency of the emails waiting a review by the multiple users can be indicated by, e.g., color coding such as, e.g., red 506 for the highest urgency, yellow 510 for intermediate urgency and white 502 for the lowest priority. Alternatively, other colors can be used. Alternatively an audio, visual, iconic, numeric, alphabetical, alphanumeric, or other indication of priority can be provided. Also, a higher priority can trigger, e.g., an audio alarm, or a wireless alert or page. No new mail 504 can be indicated on the multi-user interface as well.

In another embodiment of the present invention, inclusion of specific words or phrases in an e-mail, or subject portion, for example, can be recognized by consulting a library of words and phrases, and prior to receiving the e-mail containing the words or phrases, the e-mail can be rejected.

An automatic response can be initiated to the sender of the message indicating what has happened, or even warning the sender of consequences of sending such e-mail.

In another embodiment of the invention, delayed message delivery can permit identification of a delivery date and time for delivery of the e-mail message.

In another embodiment of the present invention, an e-mail account can be set up to auto forward any received e-mails to another e-mail address. In another, an autoreceipt feature can be enabled by a sender of an e-mail to verify that a receiver has, e.g., accessed, received, or opened e-mail. In an exemplary embodiment, a read receipt report can be displayed such as, e.g., the read receipt report as shown in FIG. 7 is described further below.

In another embodiment of the present invention, an encryption feature can enable entry of a personal encryption key between sender and receiver to control access to an e-mail. Multiple algorithms can be supported for encryption. Advantageously, in one embodiment, as new algorithms are developed, legacy algorithms can continue to be supported. Users of earlier revisions of the e-mail system set up with a first algorithm, can continue to use the first algorithm even when the program defaults to, e.g., a tenth algorithm. In one exemplary embodiment, a user's public key can be automatically generated by the present invention. In one embodiment, a public key can be automatically embedded in an email message that is being sent. The reader is referred to FIGs. 8A, 8B, and 8C for examples of a conventional public key infrastructure, exchange of public keys according to the present invention, and an email indicating a public key embedded at the top of the email shown when viewing the source code according to the present invention, respectively. Advantageously a user need not go through a complicated set up process as is conventionally required.

In an embodiment of the invention, a user's e-mail configuration can be mirrored on a server that can be accessible from a web browser, or a remote version of the mail system. This interface can give a user access to the user's address book and all the user's folders as if the user were sitting in front of the multi-user shared e-mail system computer. The user that is sending and receiving e-mail, can also be viewed, by the recipients of the e-mail, as being at the recipient's desks.

The present invention is computer platform independent. Client computer 106 in a preferred embodiment is a personal computer (PC) system running an operating system such as Windows

Mac/OS, or a version of UNIX. However, the invention is not limited to these platforms. Instead, the invention can be implemented on any appropriate computer system running any appropriate operating system, such as, for example, Solaris, Irix, Linux, HP/UX, OSF, Windows, Windows NT, OS/2, Mac/OS. In one embodiment, the present invention is implemented on a computer system operating as discussed herein. In another embodiment, the present invention can be implemented on hardware such as a handheld device, such as, e.g., a two-way pager, a cellular phone, a digital phone, a watch, a wireless device, a laptop, notebook or sub-notebook computer, and other computer type device such as, e.g., a micro-computer, a mini-computer and a mainframe computer.

FIG. 4 depicts an exemplary client computer 106 computer system. Other components of the invention, such as client computer 110, computer 302, and/or server computer 112, could also be implemented using a computer such as that shown in FIG. 4.

The computer system 106 includes one or more processors, such as processor 402. The processor 402 is connected to a communication bus 404. Client computer 106 also includes a main memory 406, preferably random access memory (RAM), and a secondary memory 408. The secondary memory 408 includes, for example, a hard disk drive 410 and/or a removable storage drive 412, representing a floppy diskette drive, a magnetic tape drive, a compact disk drive, etc. The removable storage drive 412 reads from and/or writes to a removable storage unit 414 in a well known manner.

Removable storage unit 414, also called a program storage device or a computer program product, represents a floppy disk, magnetic tape, compact disk, etc. The removable storage unit 414

includes a computer usable storage medium having stored therein computer software and/or data, such as an object's methods and data.

Client computer 106 also includes an input device such as (but not limited to) a mouse 416 or other pointing device such as a digitizer, and a keyboard 418 or other data entry device. Client computer 106 also includes an output device such as display 418, which in one embodiment is a touch-enabled monitor. Client computer 106 can also include a network interface card 422 and/or a modem 424 which can be used to access network 114.

Computer programs (also called computer control logic), including object oriented computer programs, are stored in main memory 416 and/or the secondary memory 418 and/or removable storage units 414, also called computer program products. Such computer programs, when executed, enable the computer system 106 to perform the features of the present invention as discussed herein. In particular, the computer programs, when executed, enable the processor 402 to perform the features of the present invention. Accordingly, such computer programs represent controllers of the computer system 106.

In another embodiment, the invention is directed to a computer program product comprising a computer readable medium having control logic (computer software) stored therein. The control logic, when executed by the processor 402, causes the processor 402 to perform the functions of the invention as described herein.

In yet another embodiment, the invention is implemented primarily in hardware using, for example, one or more state machines. Implementation of these state machines so as to perform the functions described herein will be apparent to persons skilled in the relevant arts.

FIG. 5 depicts an exemplary embodiment of multi-user graphical user interface (GUI) 500 including an indication of status of a plurality of different user email accounts. The GUI illustrated is a personal computer based software application program. The GUI could just have easily been a workstation application, a UNIX application, a JAVA applet, or an Internet or world wide web (“WWW” or web) browser based homepage, or applet GUI. In an exemplary embodiment, an indication of priority can be included. For example, a prioritization indication can be provided to indicate which email account should have priority. In one embodiment, a visual indication can be used. In another, an audio indication can be provided. In one embodiment, a color scheme can be used, as shown, including white record 502, 504, with lowest priority. An icon 508, 512, or no icon 504 can be used to indicate whether new mail has been received for one of the multi-user accounts. To provide prioritization, a yellow colored indication 510, 512 can stress a medium priority message. In the exemplary embodiment, a higher priority message 506, 508 can be stressed by coloring them red. A low priority message can be colored white. Selection of a user account by touching a touch screen, or selecting with a mouse or other input device such as, e.g., a keyboard, remote control, or cursor keys, can cause the email account environment to be opened, assuming the user can provide authentication such as, e.g., a password, a biometric, or other identification information.

FIG. 6 depicts an exemplary embodiment of a personal file system 600. Personal file system 600 can include a plurality of personal folders 602-640 for storing sent and received emails. FIG. 6 depicts a user interface illustrating an exemplary embodiment of a personal filing system 600 of the present invention. The personal filing system 600 can include a user's e-mail environment

including a file cabinet 602. The file cabinet 602 is a folder identified as a location to create personal nested sub-folders into which a user can organize incoming and outgoing e-mail. The user, in one embodiment, can set the properties for sending and receiving e-mail related to the file cabinet. For example, all e-mails sent by a sending user can be automatically stored in a personal folder in the sending user's personal file cabinet 600. In an exemplary embodiment, the email stored in a file folder named by the recipient's e-mail address or user name. In an exemplary embodiment, a read receipts continually updateable file can be stored in an assigned folder. A user can also modify the folder into which the e-mail can be stored upon sending. Similarly, for an email received from a sender at a recipient, the e-mail can be stored automatically into an assigned folder such as, e.g., a folder that can be set by the sending user's e-mail address or user name. In an exemplary embodiment, upon receiving an email, a recipient by selection of a single button can cause the email to be automatically stored in the assigned personal folder.

FIG. 7 depicts an exemplary embodiment of an assigned read receipt folder's read receipt report 700. Read receipt report 700 can include names 706, and email addresses 708 of recipients of the email. Upon access of the email by recipients, the read receipt report 700 can be automatically updated to include, e.g., a date and time 712 of the access, and type of access 710. The read receipt report 700, can provide various types of information in a record 702. If the email has not been accessed yet, then a blank record 704 can be provided.

FIG. 8A depicts a conventional public key infrastructure (PKI) 800 indicating an exemplary configuration of a user 1 802 in communication with a public/private key provider 804.

Public/Private key 804 can provide information from user 2 806 to provide communication between users 802, 806.

A conventional process 800 as shown in FIG. 8A can begin with step 808.

In step 808, User 1 802 sets up an account with an encryption public/private key provider 804. From step 808, process 800 can continue with step 810.

In step 810, User 2 806 sets up an account with the encryption public/private key provider 804. Suppose User 1 802 desires to send an encrypted message to User 2 806. From step 810, process 800 continues with step 812.

In step 812, User 1 802 must learn the public key of User 2 806 by communicating with the public/private key provider 804, must search for User 2 806, and must add the key information to the email address book of User 1 802 relating to User 2 806.

Suppose User 2 806 also desires to send an encrypted message to User 1 802. Process 800 continues with step 814.

In step 814, User 2 806 also must learn the public key of User 1 802 by communicating with the public/private key provider 804, must search for User 1 802 and must add the key information to the email address book of User 2 806, relating to User 1 802.

From step 814, process 800 can continue with step 816.

In step 816, User 1 802 and User 2 806 can finally send encrypted messages to each other.

An example of a conventional system implementing the system of FIG. 8A is that of Microsoft Outlook Express, available from Microsoft Corporation of Redmond, Washington,

U.S.A. Such conventional systems are cumbersome to operate and require extensive user customization as already detailed, unlike the present invention. For example, the Microsoft Outlook Express Help Index describes a difficult process by which the public/private key encryption features can be setup in Outlook. The following excerpt from the Microsoft Outlook Express Help Index, the contents of which is incorporated herein by reference in it's entirety, is demonstrative of the difficulty of such conventional solutions as shown in FIG. 8A:

Sending secure messages

As more people send confidential information by e-mail, it is increasingly important to be sure that documents sent in e-mail are not forged, and to be certain that messages you send cannot be intercepted and read by anyone other than your intended recipient.

By using "digital IDs" with Outlook Express, you can prove your identity in electronic transactions in a way similar to showing your driver's license when you cash a check. You can also use your digital ID to encrypt messages, keeping them private. Digital IDs incorporate the S/MIME specification for secure electronic mail.

How do digital IDs work?

A digital ID is composed of a "public key," a "private key," and a "digital signature." When you digitally sign your messages, you are adding your digital signature and public key to the message. The combination of a digital signature and public key is called a "certificate."

Recipients can use your digital signature to verify your identity and use your public key to send you encrypted mail that only you can read by using your private key. In order to send encrypted messages, your address book must contain digital IDs for the recipients. That way, you can their public keys to encrypt the messages. When a recipient gets an encrypted message, their private key is used to decrypt the message for reading.

Before you can start sending digitally signed messages, you must obtain a digital ID and set up your mail account to use it. If you are sending encrypted messages, your address book must contain a digital ID for each recipient.

Where do you get digital IDs?

Digital IDs are issued by independent certification authorities. When you apply for a digital ID at a certification authority's Web site, they verify your identity before issuing an ID. There are different classes of digital IDs, each certifying to a

different level of trustworthiness. For more information, use the Help at the certification authority's Web site.

In order to obtain someone else's digital ID, you can request they send you digitally signed mail, or you can search the digital ID database on a certification authority's Web site. You can also search Internet directory services that list digital IDs along with other properties.

How do you verify a digital signature?

With "revocation checking," you can verify the validity of a digitally signed message. When you make such a check, Outlook Express requests information on the digital ID from the appropriate certification authority. The certification authority sends back information on the status of the digital ID, including whether the ID has been revoked. Certification authorities keep track of certificates that have been revoked due to loss or termination.

FIG. 8B depicts an exemplary embodiment of an improved configuration method that configures a secure public/private key configuration method 818. User 1 802 can send in step 824 a message to user 2 822. In step 826, user 2 822 can send an email to user 1 820. Since, according to the present invention, a user 820, 822 can automatically have a public key be embedded in the email, the exchange shown can automatically provide public keys to the recipients of the messages.

Using the present invention, two users interested in exchanging public keys can perform the following steps:

1. Both sender and receiver can be using PointClear on their respective systems or computer(s);
2. User1 802 can send a message to User2 822; and
3. User2 822 can send a message to User1 802.

In an exemplary implementation embodiment, the above listed steps can be performed using the PointClear e-mail program of PointClear.net, Inc. of Mobile, Alabama, USA.

Variable	Mean	SD	Min	Max
Age	34.5	10.2	18	65
Gender	Male	100%		
Marital status	Married	100%		
Education	High school	100%		
Occupation	Farmer	100%		
Income	Low	100%		
Health status	Good	100%		
Smoking status	Non-smoker	100%		
Alcohol consumption	None	100%		
Family size	3.5	1.2	1	6
Household size	4.2	1.5	1	8
Land area	2.5	0.8	1	4
Water availability	Good	100%		
Soil quality	Good	100%		
Climate	Temperate	100%		
Topography	Flat	100%		
Vegetation	Forest	100%		
Wildlife	High	100%		
Human impact	Low	100%		
Conservation status	Protected	100%		
Management plan	Present	100%		
Monitoring system	Active	100%		
Research funding	High	100%		
Public awareness	High	100%		
Local community involvement	High	100%		
Government support	High	100%		
Non-governmental organization support	High	100%		
Academic support	High	100%		
Media support	High	100%		
Religious support	High	100%		
Traditional support	High	100%		
Local knowledge	High	100%		
Traditional medicine	High	100%		
Herbal medicine	High	100%		
Animal medicine	High	100%		
Mineral medicine	High	100%		
Plant medicine	High	100%		
Animal products	High	100%		
Mineral products	High	100%		
Plant products	High	100%		
Animal waste	High	100%		
Mineral waste	High	100%		
Plant waste	High	100%		
Animal by-products	High	100%		
Mineral by-products	High	100%		
Plant by-products	High	100%		
Animal derivatives	High	100%		
Mineral derivatives	High	100%		
Plant derivatives	High	100%		
Animal secretions	High	100%		
Mineral secretions	High	100%		
Plant secretions	High	100%		
Animal excretions	High	100%		
Mineral excretions	High	100%		
Plant excretions	High	100%		
Animal secretions and excretions	High	100%		
Mineral secretions and excretions	High	100%		
Plant secretions and excretions	High	100%		
Animal secretions, excretions, and by-products	High	100%		
Mineral secretions, excretions, and by-products	High	100%		
Plant secretions, excretions, and by-products	High	100%		
Animal secretions, excretions, by-products, and derivatives	High	100%		
Mineral secretions, excretions, by-products, and derivatives	High	100%		
Plant secretions, excretions, by-products, and derivatives	High	100%		
Animal secretions, excretions, by-products, derivatives, and waste	High	100%		
Mineral secretions, excretions, by-products, derivatives, and waste	High	100%		
Plant secretions, excretions, by-products, derivatives, and waste	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, derivatives, and waste	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, derivatives, and waste	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions,				

Variable	Mean	SD	Min	Max
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Occupation	Farmer	100%		
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Health status	Good	100%		
Smoking status	Non-smoker	100%		
Alcohol consumption	None	100%		
Family size	3.5	1.2	1	6
Household size	4.2	1.5	1	8
Land area	2.5	0.8	1	4
Water availability	Good	100%		
Soil quality	Good	100%		
Climate	Temperate	100%		
Topography	Flat	100%		
Vegetation	Forest	100%		
Wildlife	High	100%		
Human impact	Low	100%		
Conservation status	Protected	100%		
Management plan	Present	100%		
Monitoring system	Active	100%		
Research funding	High	100%		
Public awareness	High	100%		
Local community involvement	High	100%		
Government support	High	100%		
Non-governmental organization support	High	100%		
Academic support	High	100%		
Media support	High	100%		
Religious support	High	100%		
Traditional support	High	100%		
Local knowledge	High	100%		
Traditional medicine	High	100%		
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Mineral secretions	High	100%		
Plant secretions	High	100%		
Animal excretions	High	100%		
Mineral excretions	High	100%		
Plant excretions	High	100%		
Animal secretions and excretions	High	100%		
Mineral secretions and excretions	High	100%		
Plant secretions and excretions	High	100%		
Animal secretions, excretions, and by-products	High	100%		
Mineral secretions, excretions, and by-products	High	100%		
Plant secretions, excretions, and by-products	High	100%		
Animal secretions, excretions, by-products, and derivatives	High	100%		
Mineral secretions, excretions, by-products, and derivatives	High	100%		
Plant secretions, excretions, by-products, and derivatives	High	100%		
Animal secretions, excretions, by-products, derivatives, and waste	High	100%		
Mineral secretions, excretions, by-products, derivatives, and waste	High	100%		
Plant secretions, excretions, by-products, derivatives, and waste	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, and products	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, and secretions	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, and excretions	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, and by-products	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, and derivatives	High	100%		
Animal secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, derivatives, and waste	High	100%		
Mineral secretions, excretions, by-products, derivatives, waste, products, secretions, excretions, by-products, derivatives, and waste	High	100%		
Plant secretions, excretions, by-products, derivatives, waste, products, secretions, excretions,				

What is Claimed is:

1. A shared multi-user e-mail system on a single computer, comprising:
 - a shared computer;
 - a multi-user e-mail system configured to run on said shared computer configured to enable a plurality of users, one at a time, to access said multi-user e-mail system running on said shared computer;
 - a multi-user graphical user interface (GUI) configured to display concurrently current status of multiple email accounts of said plurality of users,
 - wherein said multi-user GUI permits one user of said plurality of users at a time to access an e-mail user account environment of said one user of said plurality of users on said multi-user e-mail system,
 - wherein said one user, if authenticated, can access only said e-mail user account environment belonging to said one user,
 - wherein each of said e-mail user account environments includes an inbox, an outbox, and at least one personal file folder; and
 - a network interface coupled to said shared computer through which e-mails can be routed to destination addresses not included in said multi-user e-mail system.

3. The system according to claim 2, wherein said indication of priority includes at least one of the following indications of priority:

- an audio;
a visual;
a color;
an iconic;
a communication to a communication device;
a page to a pager;
a numeric;
an alphabetic;
a letter;
a character;
an alert; and
a wireless alert.

4. The system according to claim 1, wherein the system is used in at least one of a production, operations, healthcare, retail, hospital, and nursing environments.

5. A real time multi-user graphical user interface (GUI) comprising:
 - a status module enabling a computer to indicate current status of multiple email accounts of a plurality of users, concurrently, on a shared multi-user computer.
6. The GUI according to claim 5, wherein said status module comprises:
 - a priority indicator enabling the computer to indicate priority of access to the shared multi-user computer.
7. The GUI according to claim 6, wherein said priority indicator comprises at least one of:
 - a visual indicator;
 - an audio indicator;
 - a color indicator;
 - a numeric indicator;
 - a alphabetic indicator;
 - an alphanumeric indicator;
 - an iconic indicator;
 - a communication;
 - a communication device;
 - an alert;
 - a wireless alert; and

a page.

8. The GUI according to claim 5, wherein said status module comprises:

a new mail indicator enabling the computer to indicate that a new mail has arrived for one of said plurality of users of said shared multi-user computer.

9. An electronic mail system comprising:

a user-assignable personal file folder.

10. The system according to claim 9, wherein emails sent from at least one of a sender and a recipient automatically stored in one or more of said user-assignable personal file folders.

11. The system according to claim 10, wherein said user assignable file folders are automatically tagged by the email address of a sender of a received email and a receiver of a sent email.

12. The system according to claim 9, wherein each of said user-assignable personal file folders comprises:

a dynamic, active read receipt report stored on a system of a sender of an email.

13. The system according to claim 12, wherein said dynamic, active read receipt report comprises:

a single file indicating read receipt status indicating which of a plurality of recipients of an email have and have not accessed said email.

14. The system according to claim 13, further comprising tracking a date and time of access by one of said plurality of recipients.

15. An electronic mail method for allowing emails to be encrypted or digitally signed, the method comprising:

- (a) embedding a public key in an email message; and
- (b) sending said email message from a first user to a second user.

16. The method according to claim 15, wherein said public key embedded in said step (a) includes performing embedding including at least one of:

- automatically embedding,
- embedding by sending user interaction, and
- prompting.

17. The method according to claim 16, wherein a sender can encrypt said email using a private key and said recipient can decrypt said email using said embedded public key.

18. The method according to claim 16, wherein a receiver can use said embedded public key to decrypt said email.

System, Method, and Computer Program Product for Providing a Multi-User E-Mail System

Abstract

A system, method, and computer program product for providing a multi-user shared e-mail system on a single computer is described. The system enables multiple users to use a single computer to provide for each user, one at a time, access to a personal secure e-mail account environment for that user. The e-mail account environment can include an inbox, an outbox and one or more folders to store received e-mail. The multiple e-mail account environments are all stored on the single computer. The single computer can be standalone, or can include an interface to a network, such as the Internet, for delivery of e-mail to users whose e-mail accounts do not reside on the single computer. The multi-user e-mail account system on a shared single computer provides cost efficient access for a large number of users which do not each need their own computer. The e-mail system includes a prioritization indicator to determine which of the multiple users of the shared e-mail system can get access first. Priority can reflect, e.g., receipt of new e-mail by an account and the urgency of received e-mail.

::ODMA\PCDOCS\DC2DOCS\251747\1

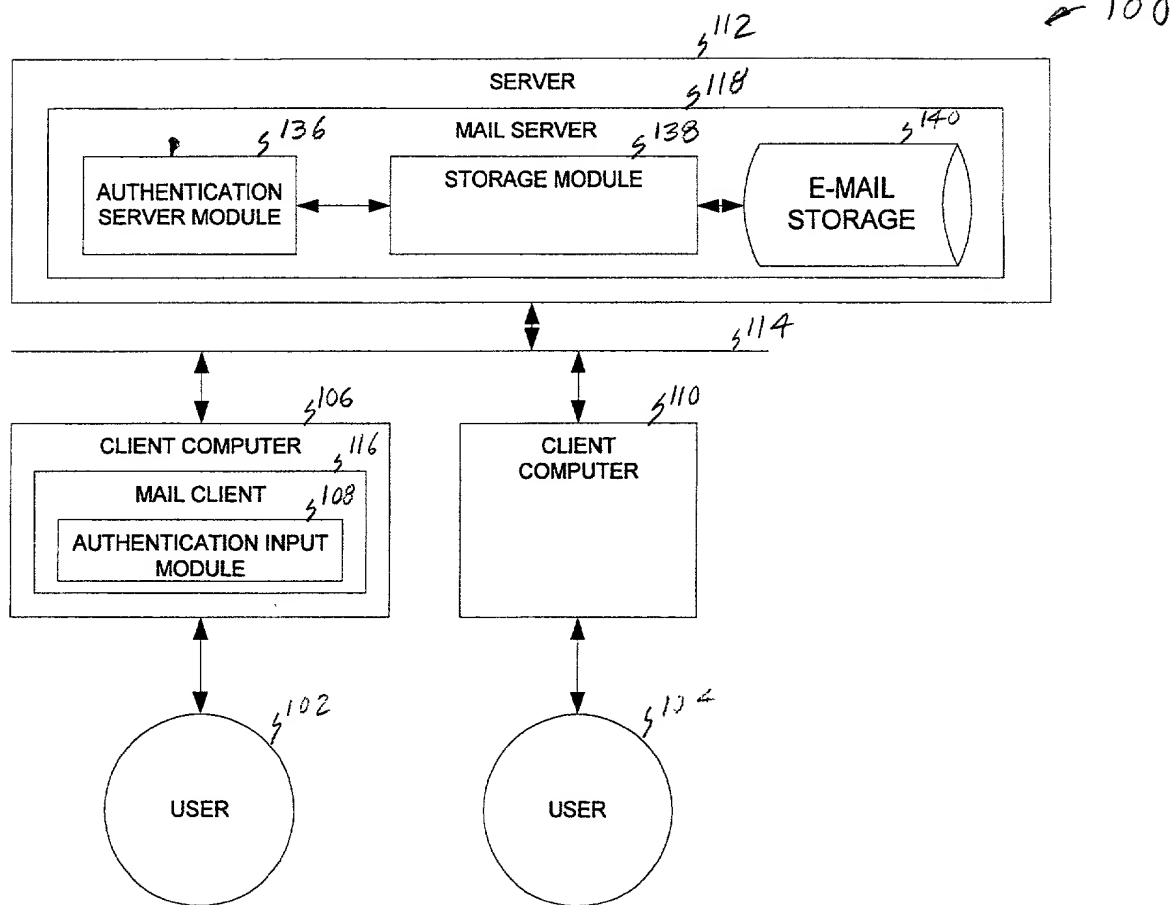


FIG. 1A

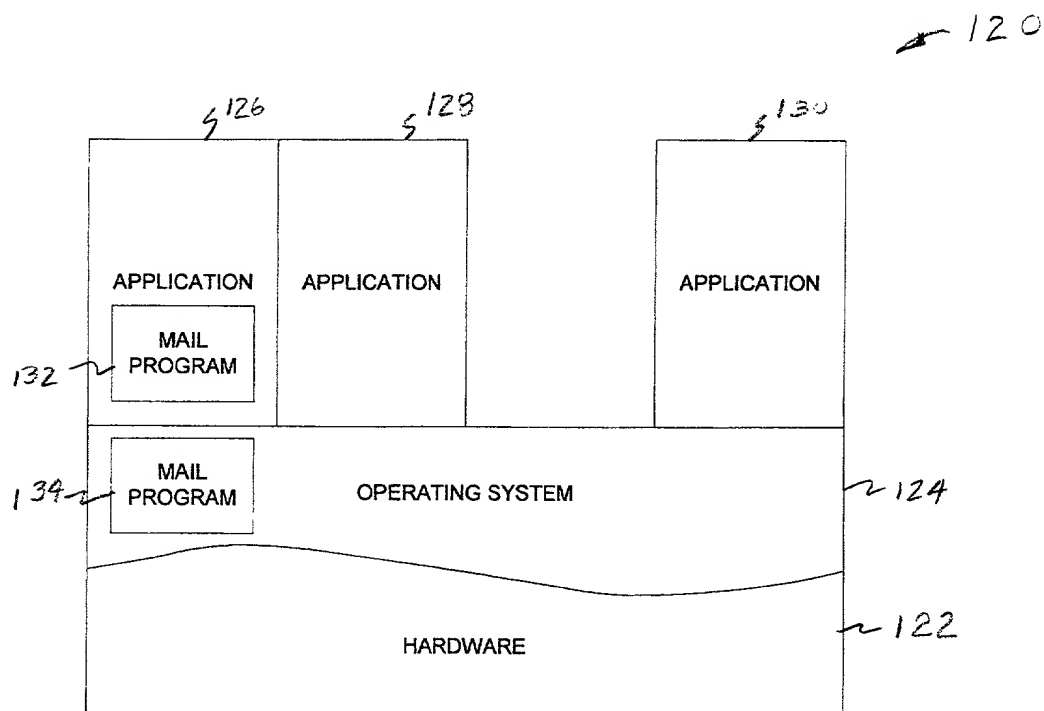


FIG. 1B

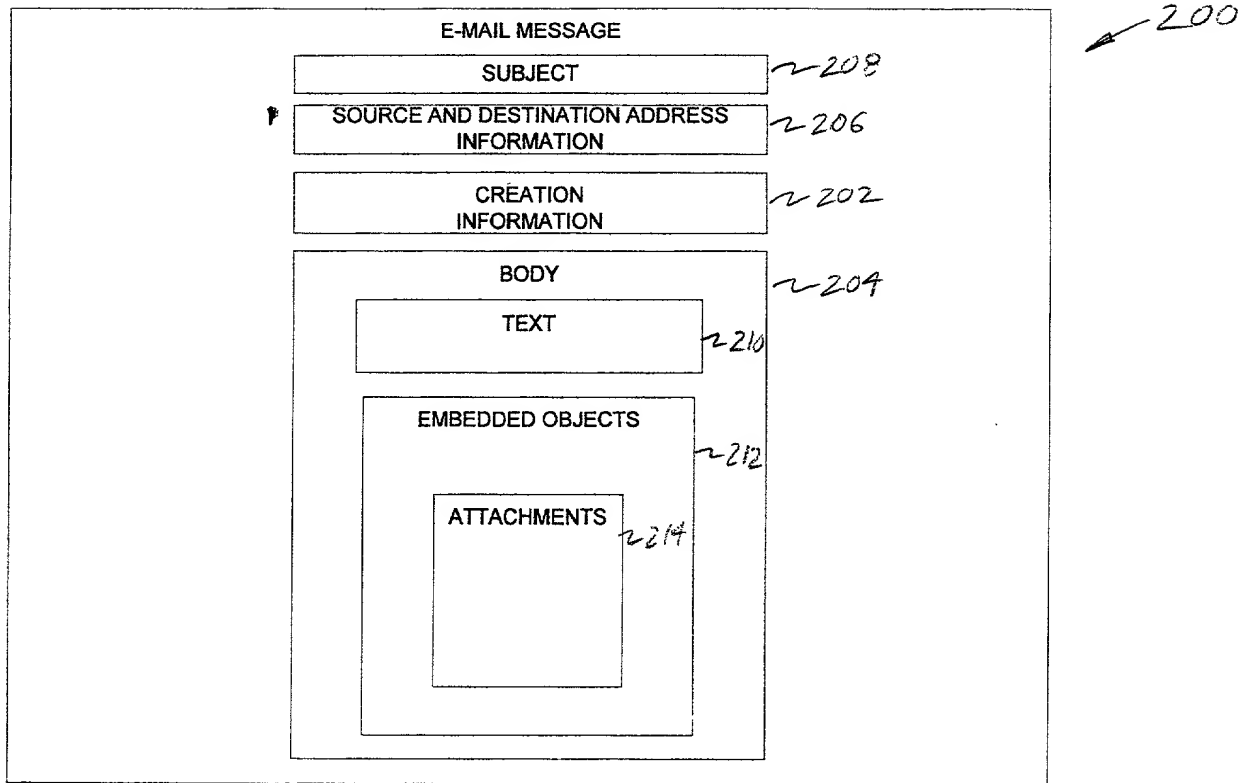


FIG. 2

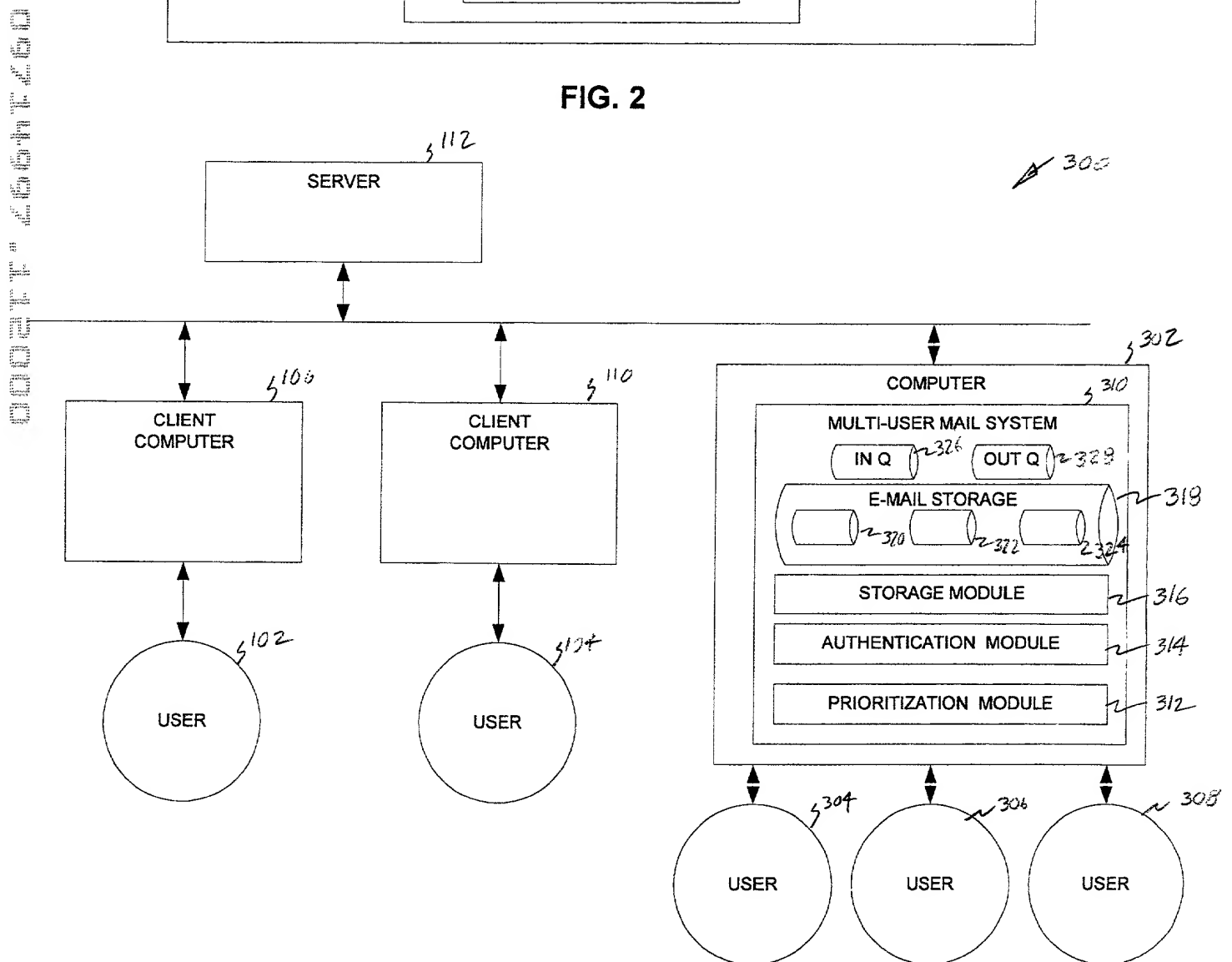


FIG. 3

FIG. 4

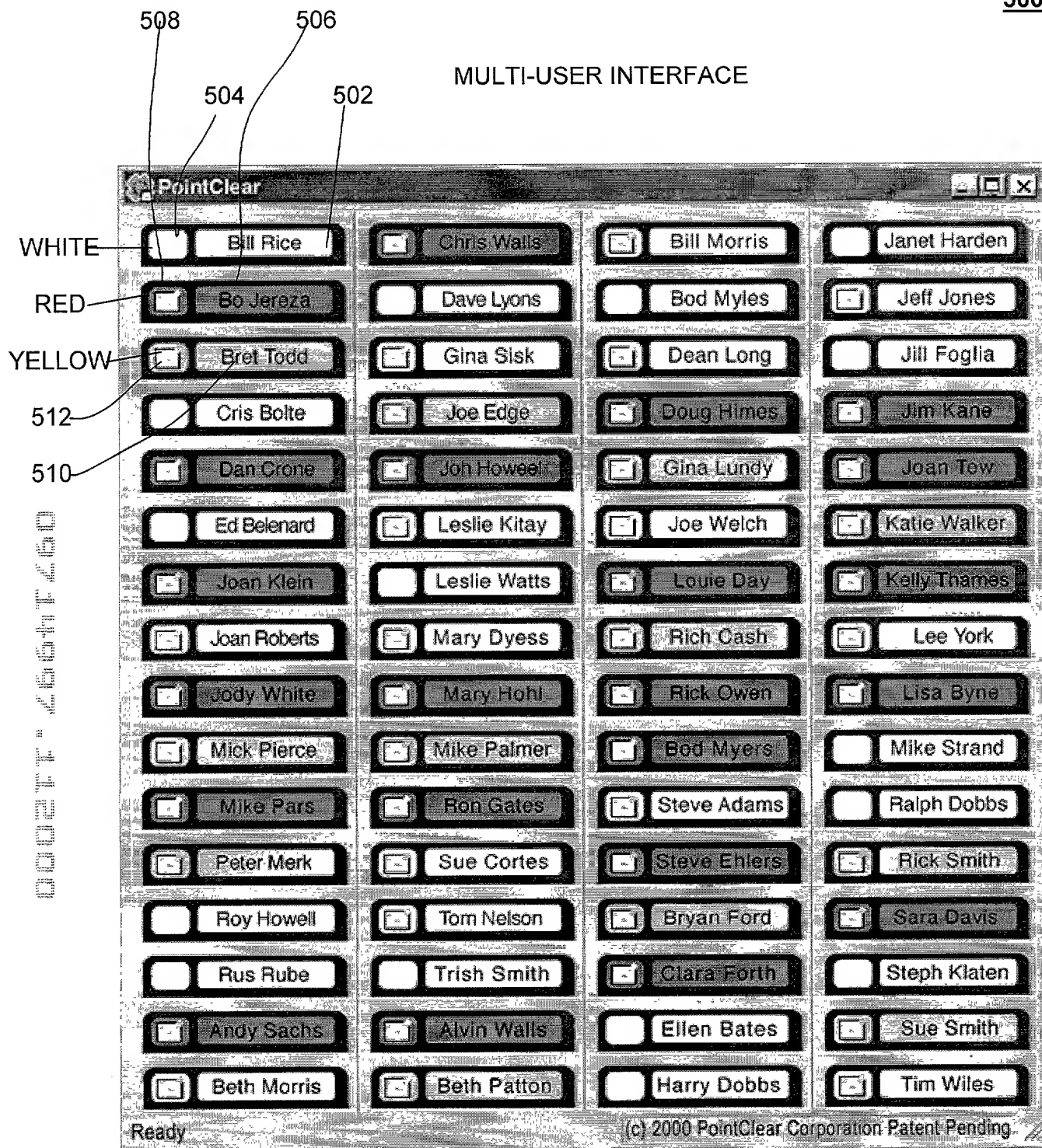


FIG. 5

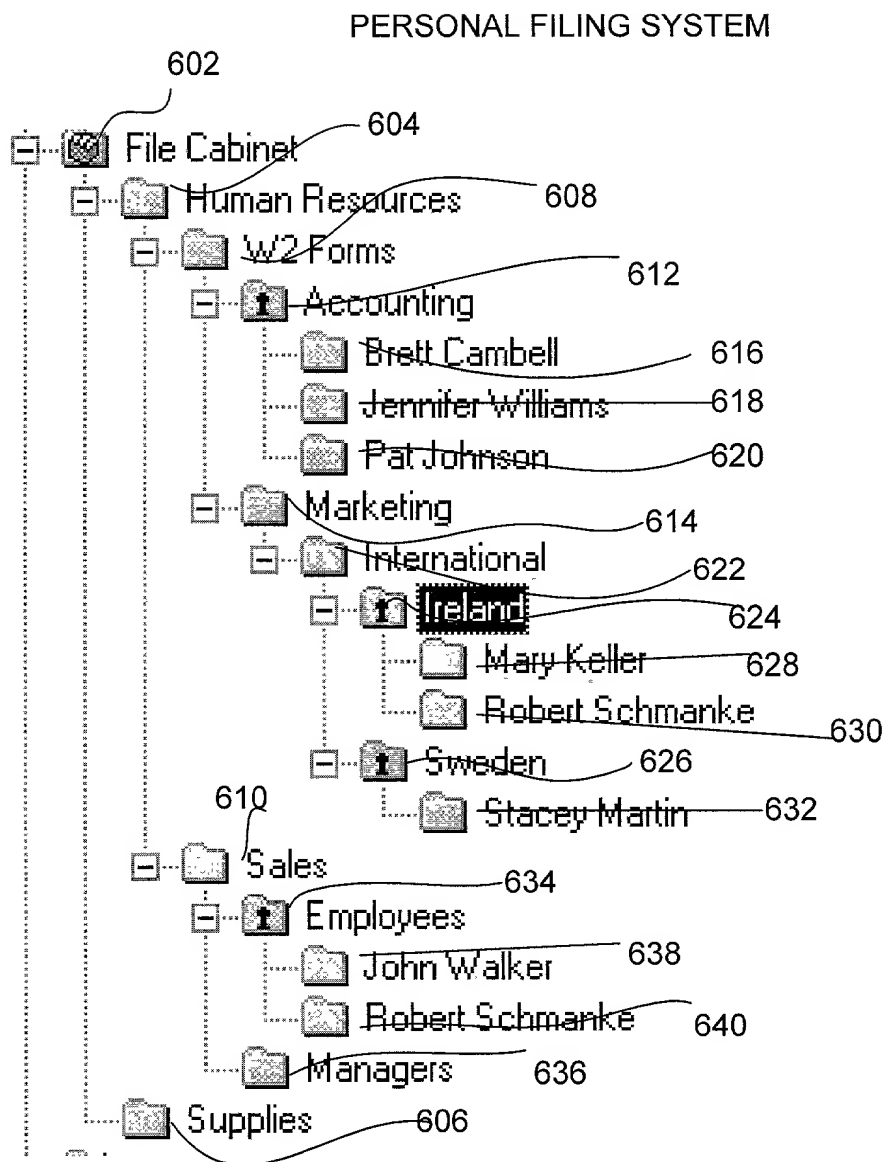


FIG. 6

READ RECEIPT REPORT

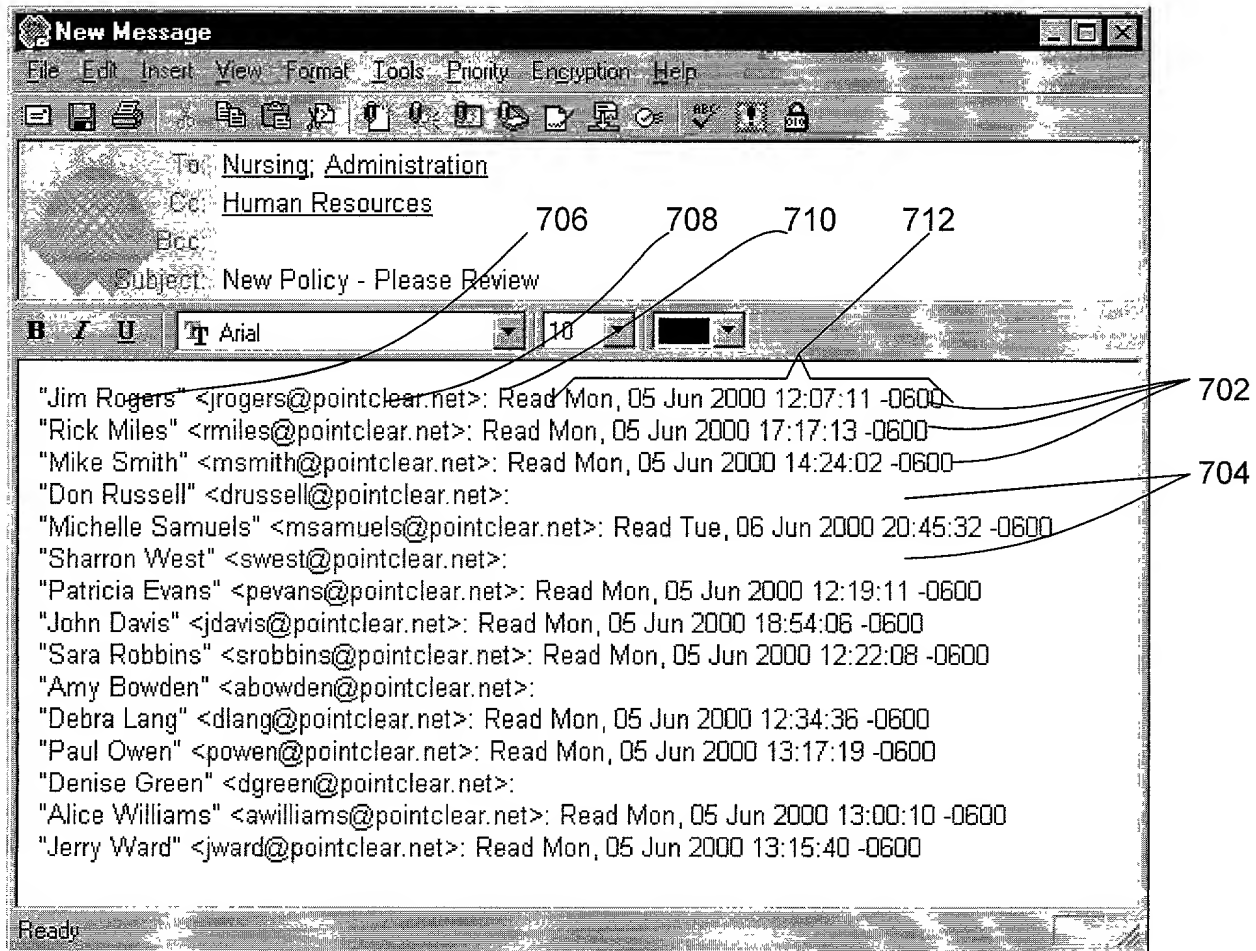


FIG. 7

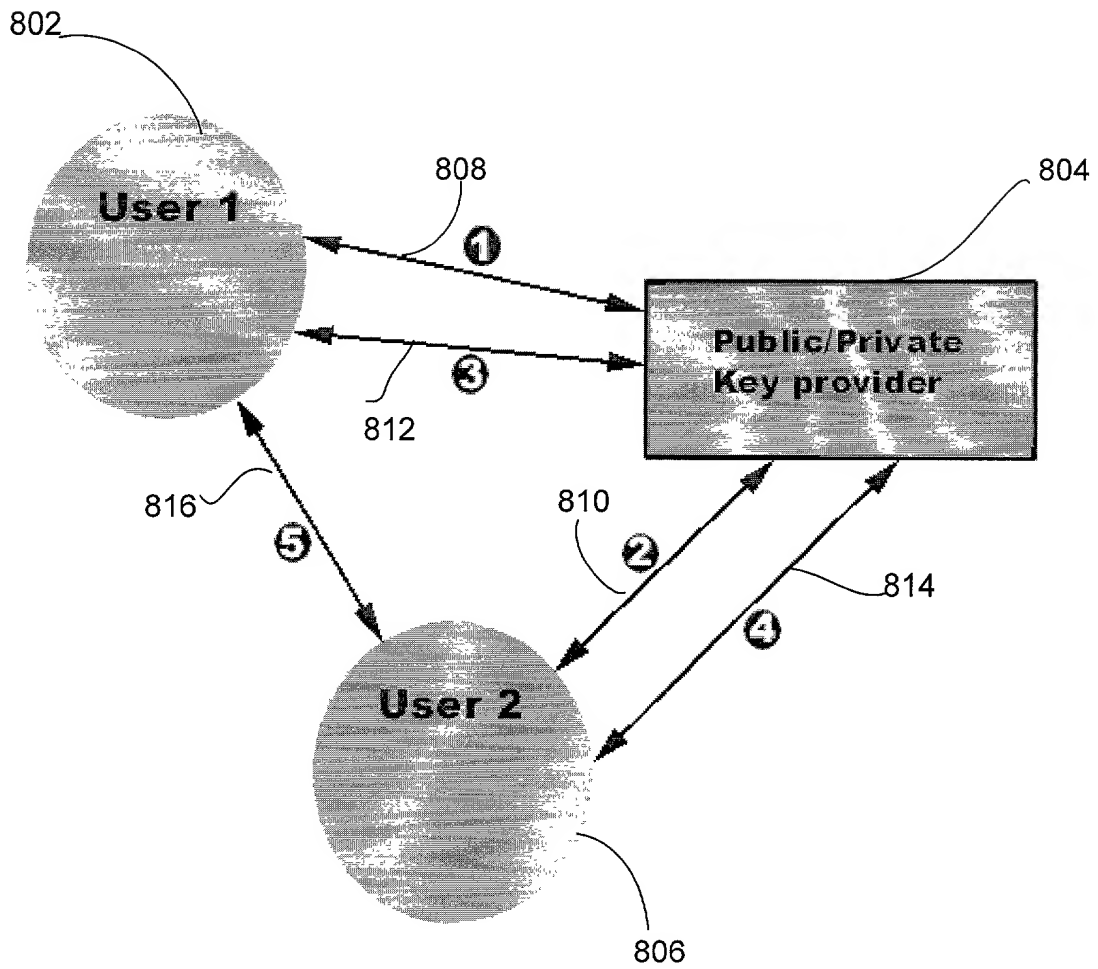


FIG. 8A

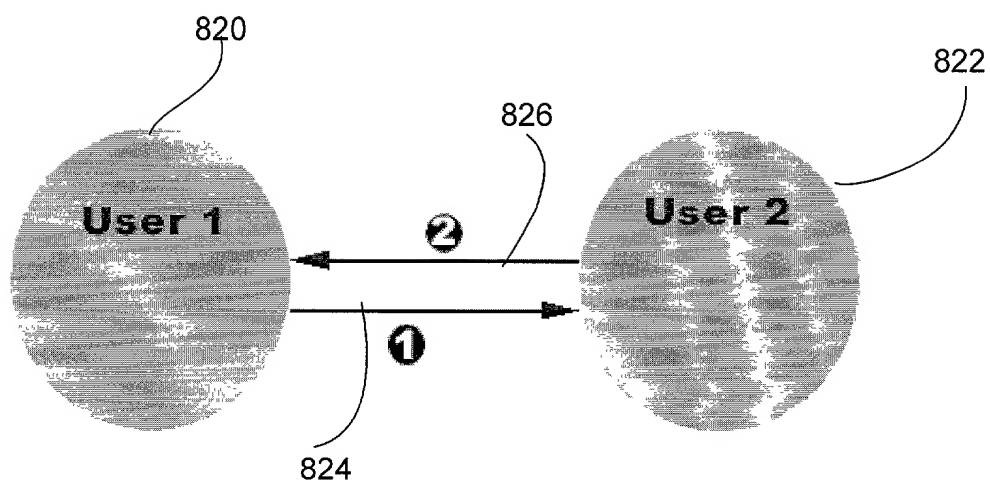


FIG. 8B

SOURCE CODE VIEW
EMBEDDED PUBLIC KEY

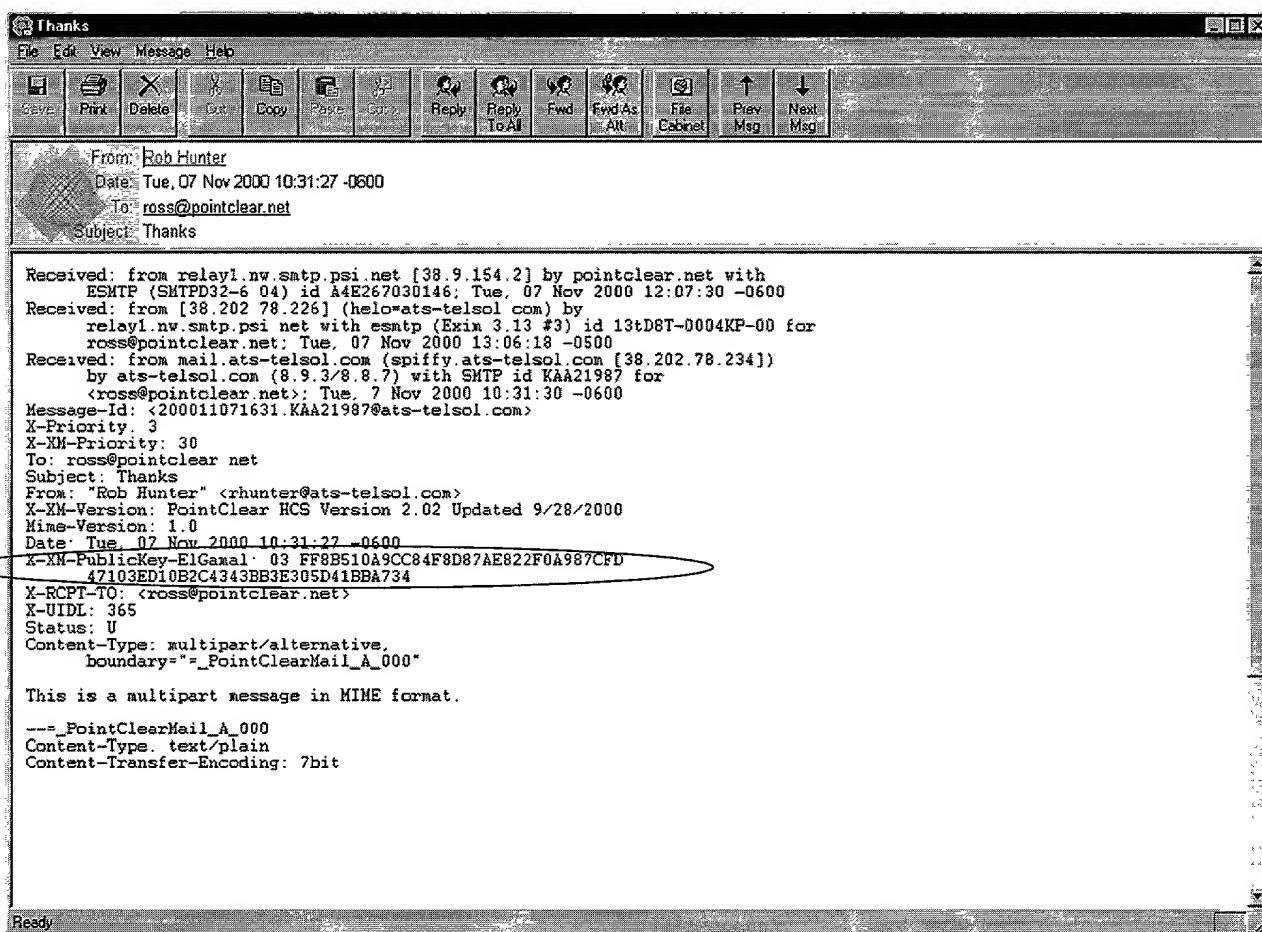


FIG. 8C